

Mitsubishi Chemical Advanced Materials Semitron® ESd 520HR (ASTM Product Data Sheet)
Categories: Polymer; Thermoplastic; Polyamide-imide (PAI); Polyamide-Imide, Molded

Material Notes: Quadrant Engineering Plastic Products is now Mitsubishi Chemical Advanced Materials.

Key Words: PAI

Physical Properties	Metric	English	Comments
Specific Gravity	1.58 g/cc	1.58 g/cc	ASTM D792
Water Absorption	0.60 %	0.60 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	4.6 %	4.6 %	Immersion; ASTM D570(2)

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell M	108	108	ASTM D785
Tensile Strength	68.9 MPa	10000 psi	ASTM D638
Tensile Strength at 150°C (300°F)	41.4 MPa	6000 psi	ASTM D638
Tensile Strength at 65°C (150°F)	62.1 MPa	9000 psi	ASTM D638
Elongation at Break	2.0 %	2.0 %	ASTM D638
Tensile Modulus	5.52 GPa	800 ksi	ASTM D638
Flexural Strength	117 MPa	17000 psi	ASTM D790
Flexural Modulus	5.52 GPa	800 ksi	ASTM D790
Compressive Strength	200 MPa	29000 psi	10% Def.; ASTM D695
Compressive Modulus	3.45 GPa	500 ksi	ASTM D695
Shear Strength	86.9 MPa	12600 psi	ASTM D732
Izod Impact, Notched	0.427 J/cm	0.800 ft-lb/in	ASTM D256 Type A
Coefficient of Friction, Dynamic	0.24	0.24	Dry vs. Steel; QTM55007
K (wear) Factor	604 x 10 ⁻⁸ mm ³ /N-M	300 x 10 ⁻¹⁰ in ³ -min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.946 MPa-m/sec	27000 psi-ft/min	4:1 safety factor; QTM 55007

Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	1.00e+10 - 1.00e+12 ohm	1.00e+10 - 1.00e+12 ohm	EOS/ESD S11.11
Dielectric Constant	5.76 @Frequency 1e+6 Hz	5.76 @Frequency 1e+6 Hz	ASTM D150
Dielectric Strength	18.7 kV/mm	475 kV/in	Short Term; ASTM D149
Dissipation Factor	0.182 @Frequency 1e+6 Hz	0.182 @Frequency 1e+6 Hz	ASTM D150

Thermal Properties	Metric	English	Comments
CTE, linear	50.4 µm/m-°C @Temperature -40.0 - 149 °C	28.0 µin/in-°F @Temperature -40.0 - 300 °F	ASTM E831
Thermal Conductivity	0.357 W/m-K	2.48 BTU-in/hr-ft ² -°F	ASTM F433
Maximum Service Temperature, Air	260 °C	500 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	271 °C	520 °F	ASTM D648
Glass Transition Temp, Tg	275 °C	527 °F	ASTM D3418
Flammability, UL94	V-0 @Thickness 3.17 mm	V-0 @Thickness 0.125 in	Estimated Rating

Compliance Properties	Metric	English	Comments
3A-Dairy	No	No	
Canada AG	No	No	
FDA	No	No	
NSF	No	No	
USDA	No	No	
USP Class VI	No	No	

Chemical Resistance Properties	Metric	English	Comments
Acids, Strong (pH 1-3)	Limited	Limited	
Acids, Weak	Acceptable	Acceptable	
Alcohols	Acceptable	Acceptable	
Alkalies, Strong (pH 11-14)	Unacceptable	Unacceptable	
Alkalies, Weak	Limited	Limited	
Chlorinated Solvents	Acceptable	Acceptable	
Conductive / Static Dissipative	Yes	Yes	

Continuous Sunlight	Limited	Limited
Hot Water / Steam	Limited	Limited
Hydrocarbons - Aliphatic	Acceptable	Acceptable
Hydrocarbons - Aromatic	Acceptable	Acceptable
Inorganic Salt Solutions	Acceptable	Acceptable
Ketones, Esters	Acceptable	Acceptable
Descriptive Properties		
Machinability	4	1-10, 1=Easier to Machine



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